

**Agency Comments on PacRim's September 2013 Draft Wetland and Waterbody Functional Assessment for the Chuitna Coal Project, and PacRim Responses
December 24, 2014.**

Agency	Comment	PacRim Synopsis of Comment	Response	Status
1 EPA	The assessment indicates that it does not fully cover the area that would be affected by the aquifer drawdown of a mining operation. We regard this as a serious flaw. The functional assessment is only one piece of information used to assess the impacts of the proposed project and alternatives in the SEIS, and the agencies have repeatedly cautioned against relying on it too heavily in that regard. Regardless, the area that will be affected by the aquifer drawdown must be regarded as part of the "affected environment." While the wetlands and waterbodies outside the proposed mine pit and infrastructure footprints would not be physically removed by the project proponents, they may be functionally eliminated from the landscape as the result of altered hydrology. Drawing down the aquifer for the life of the project and the subsequent years necessary for the aquifer to rebound would no doubt result in substantial change. This change must be addressed in the SEIS, and baseline information about what currently exists within that larger indirect disturbance footprint must be generated	1. The full modeled groundwater drawdown area needs to be included within the Functional Assessment (FA) area.	1. Most functions are now assessed for the full FA area, which includes the modeled groundwater drawdown area. The wildlife habitat functions (Habitat for Bird Species of Conservation Concern, Wildlife Species Richness, and Essential Habitat) are assessed for a smaller area due to limitations of the wildlife habitat mapping, but this area does include the entire modeled groundwater drawdown area.	Fully addressed
2 EPA	For the same reasons, information about any wetlands or waterbodies that would receive or be affected by dewatering discharges should be collected. The volumes of water from aquifer drawdown and pit de-watering will be much greater than the current surface and groundwater discharges to the wetlands and waterbodies in the project area. This water will also likely differ from the water in the wetlands and waterbodies in terms of temperature and chemistry. If the drawdown and pit water is to be discharged to wetlands or waterbodies, altered hydrology (e.g., volume, seasonality, temperature, and chemistry) will likely result in functional changes. Information about the baseline conditions of any wetlands or waterbodies proposed as receiving waters will be necessary to evaluate the effects of discharges.	2. All wetland and waterbody areas predicted to be affected by dewatering discharges need to be covered by the FA.	2. Mine dewatering discharges will all occur within the mine site (and the FA study area) and will leave the mine site via creeks. Characterizing the receiving waters outside the project footprint sufficiently to predict impacts of discharges is beyond the scope of a wetland and waterbody functional assessment. That topic is suitable for analysis in the EIS.	Fully addressed
3 EPA	The fish habitat functions attributed only the stream channels and waterbody polygons. An approach that was discussed previously was for additional areas to be attributed as providing indirect habitat. HDR Alaska believes the indirect habitat functions are captured by other functional attributions, but we are not convinced this is the case. Attributing the floodprone areas would at least ensure that off-channel stream and wetland/waterbody direct habitat is attributed.	3a. EPA questions whether indirect fish support functions are adequately addressed in the FA. 3b. EPA suggests the floodprone area should be added to the attributed as providing fish habitat.	3a. The agencies and PacRim agreed in meetings in 2012 that the fish functions would be defined as the in-water areas directly used by fish. The following functions which are assessed in the FA indirectly support in-water fish habitat: Groundwater Recharge, Groundwater Discharge, Floodflow Moderation, Shoreline Stabilization, Carbon Export, Surface and Subsurface Water Storage, Sediment and Toxicant Retention, and Nutrient Retention. 3b. The fish habitat models incorporate the best available data. In 2014, ADF&G scientists created comprehensive mapping of fish habitat, including side channels, within the proposed mine pit footprint. The OASIS habitat mapping and the Anadromous Waters Catalog data cover the full FA area and depict where anadromous salmonids have been observed. Identifying the entire floodprone area as fish habitat would overestimate the area directly used by fish under normal circumstances.	3a. Fully addressed 3b. Fully addressed

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4 EPA	The floodprone areas themselves may underestimate the areas that would receive overbank flows. An indication of this is the much larger acreage attributed with the carbon export function. Indicators for that function include wetlands with flooded hydrologic codes that have a continuous connection to a stream, lake or pond. Theoretically, these same wetlands are in position to receive overbank flows, and possibly provide fish habitat. This can be seen by the "isolated" populations of coho salmon within lakes. The assessment considers these fish to be resident populations. As coho salmon cannot successfully spawn in isolated lakes, we think it more likely that the lakes are hydrologically connected to the streams, at least intermittently. Any area known to support anadromous species should be attributed as performing that function.	4a. The flooded water regime of carbon export wetlands implies they are subject to stream overflow and are perhaps also fish habitat. 4b. Any area known to support anadromous species should be attributed as performing that function.	4a. The carbon export function logically includes more acreage than the floodprone area; for example, it includes areas at a higher elevation than the streams that connect via one-way sheetflow toward streams. Connection does not imply a carbon export area is in an overflow area. 'Flooded' in the context of Cowardin hydrologic codes does not imply flooded by a stream's overbank flow, rather that the site is inundated for any of several reasons. 4b. All lakes with documented coho presence are now attributed with the anadromous salmonid function. All areas known to be occupied by anadromous salmonid species have been attributed as performing that function. In addition, lakes and ponds that intersect channels known to be occupied by anadromous salmonids are ascribed that function.	4a. Fully addressed 4b. Fully addressed
5 EPA	Similarly, Arctic and Pacific lamprey are identified in the assessment as resident populations. These species are always anadromous in their life history, although they both have resident derivative or "satellite" species. The brook lamprey is one of the resident species, but none were identified in the study area. Unless it is shown that the lamprey were misidentified, the areas where the lamprey were found should be considered as anadromous habitat. We do not know if this would result in an expansion of the area considered anadromous.	5. Arctic and Pacific lamprey should be identified as anadromous and their use areas included in the anadromous fish habitat function.	5. The fish function names have been clarified to distinguish between anadromous salmonid species and all others.	Fully addressed

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6 EPA	The function indicators for most of the functions exclude attribution for slope wetlands with slopes of greater than 3%. For example, under the surface and subsurface water storage function, the assessment states that moderately sloped wetlands (3-7%) " are assumed to have a relatively continuous supply of water, such as from groundwater discharge, so are perennially saturated. Being both saturated and moderately sloped, they are expected to have substantially less capacity to hold water in the soil or on the surface than flatter wetlands." This statement would seem to indicate that moderately sloped wetlands would be attributed as providing the groundwater discharge function, but because attribution in that case was based on the modeled groundwater elevation, many slope wetlands were not attributed.	6a. Most of the functions exclude attribution for slope wetlands with slopes of greater than 3%. 6b. The logic HDR used to exclude 3-7% slope areas from water storage function implies those areas should be attributed with groundwater discharge function.	6a. In the August 2013 FA, wetlands on slopes of >3% were not included in areas estimated to be effective for surface and subsurface water storage; groundwater recharge; or-- outside of floodprone areas--sediment and toxicant retention, or nutrient retention. The commenter's suggestion that 3-7% slopes should not be excluded from performing several functions has led to further consideration and the following change: wetlands on 3-7% slopes are now attributed with the surface and subsurface water storage, sediment and toxicant retention - effectiveness, and nutrient retention - effectiveness functions. 6b. The groundwater recharge and discharge functions are attributed on the scale of large hills and valley bottoms; that is, on the scale of a continuous groundwater table within the surface glacial drift and alluvium which has surface contours that roughly correspond to the ground surface contours. These functions are not attributed on the scale of individual interbedded layers of varying permeability or undulating small-scale topography that may lead to water being discharged high on a hillside, to be re-infiltrated shortly downslope. On this landscape scale, a wetland's position on a large-scale landform seems a better indicator than is an individual site's gradient. However, gradient is still important: infiltration is likely to be much greater, in general, on a flatter slope than a steeper one. However, the commenter might be assured to know that approximately 80% of the wetland acreage on 3-7% slope in the proposed mine area was attributed the groundwater discharge function.	Fully addressed.

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7 EPA	Data from discharge slope wetlands throughout the Cook Inlet region (cookinletwetlands.info) indicates that groundwater is the primary source of hydrology for these wetlands. In fact, they have the strongest groundwater signature of wetlands in the region, so they could be attributed as providing groundwater discharge. The data also indicate that groundwater elevations fluctuate seasonally and these sites are not perennially saturated. Although these wetlands occur over mineral soils, they often contain peat layers of a meter or more. As a result of their variable hydrology and the combination of organic and mineral layers, these wetlands are actually well-suited to receive, store and infiltrate water. We think that the attribution of these wetlands for groundwater discharge and surface and subsurface water storage should be re-evaluated.	7. Groundwater discharge wetlands in the Cook Inlet region experience varying conditions of saturation because groundwater elevations fluctuate. Therefore, even sloped, groundwater discharge wetlands are capable of storing and infiltrating water. Re-evaluate slope wetlands for GW discharge and water storage.	7. The Chuitna Coal Project's Hydrogeologic Conceptual Site Model states: "[Groundwater] levels in the [Glacial Drift and Alluvium] generally show seasonal variations ranging from less than a foot to up to five feet" (ARCADIS 2011). The water levels decrease in late fall and winter when recharge is less due to freezing conditions. They increase in late spring and summer due to recharge by spring snowmelt runoff and summer precipitation. With groundwater elevations fluctuating little, the sloped areas wetted by groundwater discharge would be perennially saturated and not able to store substantial additional water, even if the soils are composed of peat. Nevertheless, 3-7% slopes are no longer excluded from the wetland areas attributed with the surface and subsurface water storage function. The mine site water budget indicates that approximately 97% of the water infiltrated into the glacial drift and alluvium exits the area as surface water; that is, only approximately 3% of it infiltrates to deeper groundwater systems (ARCADIS 2013). There is no evidence to suggest that the wetlands identified as locations of groundwater discharge (low in the landscape) also infiltrate water to a deeper groundwater table to any substantial degree.	Fully addressed.
8 ADNR	Page 1 & 2, Figure 1; The Chuitna Coal Project's proposed disturbance area is shown in blue on Figure 1 and with a yellow outline in supporting maps. How was the disturbance area determined? Is this the actual boundary of the coal mining, or does the disturbance area extend beyond the mining area in the form of a buffer? In places, it appears to closely follow the disturbance area identified in mine plan, water management plan, and fish study drawings, but in other places it appears to deviate significantly from the previously identified disturbance area. This is especially evident along the northern boundary of the disturbance area identified in the Wetland Functional Assessment (FA), as it includes more of Section 14 and 15 (including Lake 5) than the water management plan, fish studies drawings, and other plans we have previously reviewed. Additionally, the headwaters of Lone Creek (Stream 2002) are included in the disturbance area, but the previous mine outline did not include Lone Creek. There are also discrepancies with the southern boundary. Please explain or reconcile.	8. The area depicted as the mine disturbance area differs among several documents. The differences should be explained.	8. Figure 1 in the revised FA now shows the currently proposed footprint of the mine project features outlined in blue; that is, the area that would be excavated, filled, or graded, or part of a non-aerial structure at the mine pit, mine and personnel support facilities, transportation infrastructure, and Ladd Landing Development. It does NOT include the footprint of features below high tide line, locations of currently proposed fish mitigation sites, or the modelled groundwater drawdown area. This is described in the FA text. The mine plans are continually advancing and studies may show different boundaries based on when the study was completed and the study's topic or purpose. Therefore, the disturbance and project feature boundaries shown in various baseline and engineering study documents do not match. This FA area encompasses the area presently proposed to be directly affected by mining and related activities, plus the area that models indicate would be affected indirectly by groundwater drawdown, plus additional surrounding area. It does not (for the most part) include proposed stream mitigation sites (see response to comment 9). The current project footprint is shown on Figure 1 simply to depict how the FA area relates to it; the project footprint may be modified through the course of permitting.	Fully addressed

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9 ADNR	PacRim has provided ADF&G conceptual drawings identifying proposed areas for fish habitat mitigation. This mitigation will be required by ADF&G to occur prior to mining with the goal of creating “replacement” fish habitat for fish that will be displaced once the project begins. The maps supporting this Wetland FA indicate that some of the disturbance area overlaps with locations identified for fish habitat mitigation. It is unclear if that means some of these areas are in the disturbance footprint of the mine, therefore making them unsuitable options for habitat mitigation, or if the disturbance area should actually be expanded to incorporate all of the areas where habitat mitigation is being proposed (i.e., because wetlands could be impacted by being converted to stream or pond for fish habitat). If it is the latter, then the disturbance footprint needs to expand to include all of the area being considered for habitat mitigation. Please explain or reconcile.	9. The proposed disturbance area shown in the FA overlaps with the location of some of the fish habitat mitigation sites which are supposed to be complete before mining. This is a conflict. Areas proposed for pre-mining mitigation should be included within the disturbance footprint.	9. All of the proposed stream mitigation sites depicted in the June 2014 Working Draft, Fish Protection Plan, Chuitna Coal Project – Mine Area are outside of the direct mine pit and facilities footprint with the possible exception of a conflict between a coal conveyor support tower and one mitigation site. The north part of the proposed Lake 5 stream mitigation area is within the modeled groundwater drawdown area. It is within the FA study area. For the most part, the other proposed stream impact mitigation sites shown in the June 2014 Working Draft Fish Protection Plan are not within the FA area. The existing functions of those sites can be analyzed later if that is determined to be necessary.	Fully addressed
10 ADNR	Page 8, Table 5; This table is a list of species “observed or expected to occur in each project component...” A number of species on this list have been observed in the mine area but are not checked, meaning the mine area species are likely underrepresented. According to field notes from OASIS reports, common loons were observed on two separate lakes in the mine area disturbance footprint, yet this species is not checked as an observed or expected to occur species in the mine area. An ADF&G biologist has observed Wilson’s snipe (breeding), semi-palmated plover (breeding), Arctic tern, common loon, mew gull, and hairy woodpecker species in the mine area during the timeline that the baseline studies occurred. The type of habitats available in the mine area are very often used by the species identified above, making it unclear why these species are not included as ‘observed or expected to occur’ in the mine area. Please explain or reconcile, as this may affect the species richness in the mine area project component.	10. ADNR questions why some species observed in the study area, according to OASIS reports, are not shown as having been observed. This affects wildlife function assessments.	10. The rest of the Table 5 title is: “...for which ABR determined habitat importance ratings.” ABR produced habitat-importance ratings for only select species and reported those ratings in the Wildlife Protection Plans for each project component. The FA draws from the results of other professional reports and cannot fully explain the contents of those reports. Readers will need to refer back to the original reports for details.	Response is complete. No changes to FA are needed.
11 ADNR	Page 15; The Wetland FA refers to the Chuitna Coal Project Freshwater Aquatic Biology Study Program (OASIS 2008) for identifying anadromous fish habitat. The Wetland FA states that “OASIS scientists mapped stream habitat that, based on field studies and professional judgment, they considered potential anadromous fish habitat... The 10.4 miles of anadromous fish stream habitat identified by OASIS in the Mine Area ... were attributed as anadromous fish habitat...” The OASIS report does not identify these 10.4 miles as all inclusive for anadromous fish habitat in the mine area. Many tributaries were not surveyed or were not sampled to determine the upstream extent of anadromy. The OASIS report concedes that even where fish were not captured they may be present. The report does not map the entire extent of anadromous fish habitat in the mine area and should only be used as a starting point for identifying areas that ‘are known or are assumed to provide habitat’ for anadromous fish. The OASIS report identifies locations where anadromous fish were captured or otherwise documented, but it does not ‘map stream habitat....considered potential anadromous fish habitat’ as reported in this FA. Areas providing habitat for anadromous fish may be under- represented in this FA.	11. ADNR corrected what it believes are misstatements about the OASIS reports.	11. ADNR correctly stated that the OASIS reports were not the source of the habitat maps. OASIS’s mapping was provided as a separate stand-alone file. The fish habitat mapping has been supplemented since the last version of the FA and the layers used for this FA are better described.	Fully addressed

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12 ADNR	The definition of this function limits consideration to waterbodies and wetlands that directly provide physical habitat for fish, which fails to include all waterbodies and wetlands that are important or critical to fish populations. For example, the definition precludes consideration of the importance of headwater wetlands and streams to ecological functions downstream. Headwater streams and wetlands provide flow stability, nutrient processing, organic matter cycling, temperature regulation, filtration, and other functions that are critical to the ecological stability of fish habitat downstream. These critical functions are not assessed in the Wetland FA for anadromous fish habitat, but need to be accounted for in some way, even if as a separate fish habitat support function. The extent of this function should include headwater areas directly impacted by mining and those impacted by groundwater drawdown.	12. ADNR states that several functions important to anadromous fish habitat are not assessed in the Wetland FA.	12. In agency meetings in 2012, and in the August 2012 FA Methods document, it was clearly established that the FA functions would represent habitat directly used by fish. Other components of this functional assessment address each of the processes cited by ADNR, including: floodflow moderation, surface and subsurface water storage, shoreline stabilization, groundwater discharge, groundwater recharge, carbon export, sediment and toxicant retention, and nutrient retention. Each of these functions is evaluated for full FA study area, which includes the headwater areas directly impacted by mining and those potentially affected by groundwater drawdown.	Comment has been addressed.
13 ADNR	Several reports are referenced in the text but are not listed as references in the literature cited (OASIS 2007, OASIS 2008, OASIS 2009, and OASIS 2010).	13. Cited references are missing from the References section.	13. References are now included.	Comment has been addressed.
14 ADNR	Page 16; The 1st paragraph states that lakes or ponds that are not connected to a fish stream should not be considered anadromous or resident fish habitat. This is incorrect and will lead to an underestimation of fish habitat. Without more extensive sampling, it is hard to determine that these lakes or ponds are not connected at certain times of the year, or under certain hydrologic regimes. Ephemeral streams, flood events, or connections through peat, may provide fish with access to these seemingly isolated lakes or ponds. Furthermore, lakes and ponds throughout the region without visible surface connections to streams are known to support resident fish species. If the waterbodies in question are similar to other waterbodies in the region that are known to support fish, than it is reasonable to assume that the unsampled waterbodies do provide fish habitat.	14. Connection to a fish stream should not be a requirement for a lake or pond to be considered fish habitat.	14. The referenced statement has been removed. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G.	Fully addressed.
15 ADNR	This report cites the OASIS 2008 freshwater aquatic biology report as the basis for categorizing coho salmon captured in lakes as resident species. However, the OASIS report states that these populations are residual populations that are derived from anadromous parents or migrating juveniles. The OASIS report specifically states that the coho salmon population in Ladd Lake 2 is a spawning, self-sustaining population and that lakes in the mine area provide anadromous fish habitat that is temporally and/or partially available to anadromous fish populations. Furthermore, it states that lakes in which fish were not captured may have fish (especially coho salmon) in the future or they may have been missed by limited surveys. Lake 5 and Ladd Lake 2 have been nominated and accepted in the 2014 Anadromous Waters Catalog (AWC) for coho salmon presence. Lake 4 has been nominated to the AWC and is currently in review. These lakes, along with Lake 9, have documented presence of coho salmon with acknowledgement from the OASIS fish studies that they derived from anadromous parents and should be considered as habitat for anadromous fish in this Wetland FA. The Wetland FA cites the OASIS 2008 report as the basis for identifying potential anadromous fish habitat, and the OASIS 2008 report documents coho salmon populations in lakes that the Wetland FA does not consider anadromous. ADF&G considered waters with coho salmon populations as anadromous waters and designates nominated waterbodies as such in the AWC.	15. FA representation of lake anadromous fish habitat is wrong in various ways.	15. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. All lakes with documented coho presence (per OASIS 2008) were given anadromous function. Lakes 4, 5, and 9, and LL2, are included in anadromous function.	Fully addressed
16 ADNR	What studies were done to show that Dolly Varden, Arctic lamprey and Pacific lamprey were resident and not anadromous? For example, adult lamprey with sharp teeth, as opposed to rounded teeth, have been captured at PacRim's weirs during baseline studies. Lamprey with sharp teeth are typical of parasitic lamprey, which tend to be anadromous. The ADF&G AWC lists lamprey species in these drainages as anadromous. Please provide evidence or rationale for considering these species resident.	16. Lamprey should be considered anadromous.	16. Same as comment and response at 5 above.	Fully addressed
17 ADNR	ERM identified 3.3 miles of stream segments as resident-only fish habitat within the proposed mine disturbance footprint. However, none of these stream segments have been surveyed or sampled and some are connected to documented anadromous fish waters. It is estimated that more than half of the anadromous fish waters in the state are not listed in the AWC simply because they have not yet been surveyed. Please provide rationale for considering un-surveyed streams, that are connected to documented anadromous fish bearing waters, as resident-fish only habitat.	17. Streams that have not been surveyed should not be assumed to be resident-fish only fish habitat.	17. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. Statements have been added that acknowledge that additional, but undocumented, anadromous fish habitat may exist.	Fully addressed

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18 ADNR	The groundwater and water storage maps supporting this Wetland FA show more miles of stream in the mine area than is depicted in the fish habitat maps. Please provide rationale for not considering these un-surveyed streams as potentially fish bearing waters, when they are connected to documented fish bearing waters.	18. Why are unsurveyed streams not considered fish habitat?	18. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. If a stream is not ascribed one of the fish functions, there is not documentation that it is occupied by fish.	Fully addressed
19 ADNR	The Wetland FA states that, for fish habitat, the proposed disturbance footprint does not include the entire groundwater drawdown area. The importance of the hydrologic connectivity between surface water and groundwater in a river system that supports salmon has been well documented. The groundwater/surface water connection is important for maintaining base flow in the stream during critical life stages such as overwintering and egg incubation in fish populations. It is also important for stabilizing water temperatures and water chemistry, all of which are important components of salmonid fish habitat. Wetlands that provide groundwater discharge near streams should be considered to provide direct functional benefits to salmonids based on basic ecological and hydrologic principles.	19. The connection between surface and groundwater and its importance to fish habitat is well documented. Implication is that areas of groundwater drawdown should be assessed for fish habitat.	19. The FA assesses fish habitat and most other functions (except the wildlife habitat functions) for the full FA area, which includes the groundwater drawdown area. The detailed ADF&G mapping exists only for the proposed mine pit area, and other Chuitna Coal Project baseline fish data are used for the remainder of the FA area.	Fully addressed
20 ADNR	Page 17, Table 10; The title of the table is “Results of lake surveys for resident fish conducted in 1982-1984, 2006, and 2007” and cites the source as OASIS 2007. The OASIS 2007 report never identifies the coho salmon from Lake 4, Lake 5, Lake 9, and Ladd Lake 2 as resident. The OASIS report identifies them as residual with anadromous parents. ADF&G considers these lakes containing coho salmon as anadromous water bodies.	20. Lakes containing coho salmon should be considered anadromous waterbodies.	20. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. All lakes with documented coho presence (per OASIS 2008) were given anadromous function. Lakes 4, 5, and 9, and LL2, are included in anadromous function.	Fully addressed
21 ADNR	Page 23; The Wetland FA states that “Groundwater discharge to wetlands or streams may be important for maintain stream base flows during low water periods in the winter, as well as for stabilizing water temperatures and water chemistry. “ Based on basic ecological and hydrologic principles, the report should state that groundwater discharge to streams is important for providing these functions. As mentioned previously, it is unclear why anadromous fish habitat, as described in the FA, doesn’t include potential habitat outside of the proposed mine disturbance footprint, but within the groundwater drawdown area. We know the interaction between groundwater and surface water is important for salmon. Please justify or expand the area considered.	21. ADNR wants sentence reworded.	21. Sentence is reworded.	Fully addressed
22 ADNR	Page 32, Table 14; The table reports that only 20 acres of wetlands perform the function of anadromous fish habitat in the Mine Area and that 0 acres provide this function in the Project Infrastructure and Ladd Landing. We believe this acreage is under reported based on the comments above.	22. ADNR believes that the acreage of fish habitat is underreported based on above comments.	22. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. Updated acreages are reported.	Fully addressed
23 ADNR	Fish Habitat Functions Maps; Several lakes in these maps are connected to anadromous fish streams, which are depicted by the blue lines. Based on basic ecological and hydrologic principles, lakes connected to anadromous fish streams would also contain anadromous fish habitat. Beaver dams may make these lakes temporally or partially unavailable, but beaver dams should not be viewed as permanent barriers. The OASIS fish studies make the same conclusion that these lakes provide anadromous fish habitat that is sometimes utilized or is temporally available. All lakes adjacent to anadromous streams should be considered to provide the function of anadromous fish habitat (includes Lake 5, Lake 7, Lake 12, Pond 5, and Ladd Lake 2).	23. Lakes connected to anadromous fish streams should be considered anadromous fish habitat.	23. The fish functions have been substantially reworked to represent known habitat used directly by fish, as determined by OASIS and ADF&G. Lakes and ponds with documented presence of anadromous salmonids (including any coho) are ascribed the anadromous salmonids function, as are lakes and ponds that intersect known anadromous salmonid stream reaches.	Fully addressed

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24 NVT/ North Ecology	<p>General Comments Assessment Method</p> <p>The purpose of a wetland functional assessment is to inform the development of a strategy to mitigate the loss of wetlands and other waterbodies (to simplify writing, "wetlands and waterbodies" will be addressed simply as wetlands). As noted in the Assessment every wetland assessment method has limitations. Methods were originally developed in the lower 48 states to address losses in highly modified landscapes where the aerial extent and function of wetlands was greatly diminished, as was overall ecosystem function of the surrounding landscape. Most methods identified individual functions then quantified the degree of function so that loss could be quantitatively mitigated. This approach is focused on individual wetland functions but not the overall ecosystem.</p> <p>The Assessment by PacRim continues in this tradition in that it identifies wetland functions, then individually assesses them. It differs from most methods in that it evaluates wetland function qualitatively then uses presence/absence in the final description of a function. The final description of potential wetland functional loss is an assignment of presence or absence based on occurrence above a threshold. This approach is appropriate for a site such as the Chuitna Coal Project where there is insufficient data to develop quantitative wetland models and assignments of function are based primarily on professional judgment.</p> <p>However, like other methods, this approach is reductive. It fails to consider that wetlands are part of an ecosystem that occupies a landscape. The results of such assessments are often used to replace function in a piece-meal fashion. An example of such a piece-meal approach is the PacRim proposal to mitigate lost salmon habitat by building ponds in which to rear coho salmon. A particular function may be replaced, but the rest of the ecosystem and the values and services it provides are lost.</p> <p>Such a reductive approach may be appropriate for identifying mitigation needs for projects that affect specific remaining functions on a highly disturbed landscape or for small projects that, because of their scale, affect limited functions. For example a building pad may result in increased storm water runoff and loss of wildlife habitat on site. It might be mitigated on site or at another site nearby to account for loss of those functions in the same ecosystem. But for a project covering thousands of acres that will significantly alter all aspects of an ecosystem at the site, an approach that takes into account the entire ecosystem is more useful.</p> <p>Mitigation based on a wetlands assessment may not be appropriate on large projects that significantly alter a large area of landscape. Mitigation in such circumstances may be better based on the overall loss of the wetlands ecosystem quantified by aerial extent.</p>	<p>24. The results of the FA should not be used to identify replacement of individual functions because that approach fails to consider the whole ecosystem and its values and services that are lost. Mitigation may be better based on acreage extent of wetland and waterbody loss.</p>	<p>24. How this FA will be used to identify appropriate mitigation is not yet determined. This comment is pertinent to mitigation, not the actual FA.</p>	No change needed.
25 NVT/ North Ecology	<p><u>Specific Comments</u></p> <p>3.0 Methods; If we put aside the above comments on ecosystem level loss, the methods applied are generally reasonable for the Chuitna Coal Project. They recognize that wetlands in the Chuitna system are not disturbed and therefore would all be considered to be "reference wetlands" in other wetland assessment methodologies —highly functioning wetlands against which to quantify the function of other wetlands. Instead this method applies a presence/absence system of addressing loss of wetland functions. If the function is present above a threshold then it is considered to be present, otherwise it is considered to be absent, or not worth considering in mitigation.</p> <p>While the overall approach is acceptable, the method will result in a failure to mitigate wetland functions that exist but are below the threshold. Even "low" functioning wetlands provide values or services and should be considered in mitigation.</p>	<p>25a. If a function is determined to not occur above the threshold, it will be considered absent and...</p> <p>25b. ... its loss not considered in mitigation. All wetlands should be considered in mitigation, even if low functioning.</p>	<p>25a. Section 3.1 states: "The chosen FA method identifies where each function is likely to occur at a relatively high level. Outside of those identified areas, the function may still occur, but at a lower level."</p> <p>25b. Comment is about mitigation, not the FA. No changes needed.</p>	No change needed.

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26 NVT/ North Ecology	<p>3.5.1 Habitat for Bird Species of Conservation Concern (BSCC); It is not clear how or why a threshold value of greater than or equal to 25 percent of BSCC was developed. Low and moderate value habitat could be important for each of these bird species. In the event of a landscape scale disturbance, such as fire, low value wetlands could be the refugia from which recovering areas are colonized.</p> <p>Consideration should be given to assigning this function to all wetlands that are judged to have habitat for any BSCC.</p>	26. Consider assigning this function to all wetlands that provide habitat for BSCC. The rationale behind the thresholds used to ascribe this function is not clear.	<p>26. The '25% of BSCC' threshold is based solely on best professional judgment. Scientists considered it sufficiently conservative (a low threshold); habitats that provide low-value habitat (1, on a scale of 0 to 4) for 25% or more of the BSCC that occur in that project component are ascribed this function.</p> <p>This function was newly added by agency request in 2012. The proposed method for the function was presented in the August 2012 draft FA Methods report, which was issued for agency comment. USFWS commented that perhaps any habitat use by a BSCC should be considered important and asked how that would change the outcome of the assessment. At the October 16, 2012, meeting HDR reported that ascribing this function to habitat types considered of low value for any BSCC would mean every habitat type except sweetgale fen would be considered to perform the function. Meeting notes state: "At the end of this discussion, EPA and USFWS agreed that they approve of the FA methods for diversity and no changes are needed..." (not for BSCC). Action items did not include changing the BSCC function. However, as a result of this meeting, PacRim added a function: Essential Habitat for One or More Wildlife Species.</p>	No change needed.
27 NVT/ North Ecology	3.5.2 Wildlife Species Richness; The approach used here is reasonable. However, it is not clear why the cut-off value for habitat was set at moderate for wildlife richness, while it was set at low for BSCC. This appears arbitrary. The rationale for this should be explained or the threshold should be changed so that low value habitat is included and only habitat of negligible performance is excluded.	27. Threshold cut-offs for inclusion in this function differ from those for BSCC, which seems arbitrary.	<p>27. The threshold for being ascribed the function was set relatively lower for the BSCC function because all of those species are 'of Conservation Concern'. This function was described in the August 2012 draft FA Methods for agency review. Meeting notes state: "At the end of this discussion, EPA and USFWS agreed that they approve of the FA methods for diversity [richness] and no changes are needed..."</p> <p>Nevertheless, PacRim lowered the threshold to match the ≥25% threshold used for BSCC.</p>	No change needed.

Agency	Comment	PacRim Synopsis of Comment	Response	Status
28 NVT/ North Ecology	3.5.3 Essential Habitat for One or More Wildlife Species; The approach used for this function is reasonable. However, another similar function should address habitat for key wildlife species. These species may be important for subsistence reasons or they may be ecological keystone species. While we recognize that values, such as subsistence and hunting will be addressed in the Supplemental Draft Environmental Impact Statement, habitat for key species relates to the habitat function of wetlands for these species rather than to their value to humans. This new function should be structured so that all habitat that supports the species is identified.	28. Add a function that identifies all habitat that supports key wildlife species such as ecological keystone species or subsistence species.	28. PacRim and the regulatory and resource agencies discussed and agreed upon the wildlife functions that would be included in the FA. Please compare the methods used in this FA to industry-standard methods for assessing wildlife function in wetland functional assessment. Standard methods typically address wildlife in one or two functions such as “General Habitat Suitability” or “Contribution to Abundance and Diversity of Wetland Fauna” which use generic indicators. The Chuitna FA uses site- and species-specific information, analyzed in three ways to identify the wetlands that are more important wildlife habitat. This approach allows reviewers to distinguish wetland types from each other in terms of wildlife importance.	No change needed.
29 NVT/ North Ecology	<p>3.5.4 Anadromous Fish Habitat; The definition of this function explicitly excludes wetlands that provide a supporting role for anadromous fish habitat. It ignores the importance of headwater streams to the ecological integrity of down stream waters. Headwater streams provide flow stability, nutrient processing, organic matter and other functions that are critical to the ecological stability of downstream waters (see Nadeau and Rains 2007). These waters should be included in the anadromous fish habitat function or a separate fish habitat support function should be developed. The aerial extent of this function should include upstream waters that may be isolated by mining or groundwater drawdown.</p> <p>It is also important that this function include waters that may be isolated from upstream or lateral waters on the surface but may be connected subsurface. For example streams in peatlands will often flow through "pipes" of peat. Fish can travel through these "pipes" to reach upstream waters that are exposed at the surface.</p> <p>While this phenomenon likely occurs extensively where streams flow through peatlands, we are aware of tributary streams on Stariski Creek and small ponds tributary to the Port Graham River on the Kenai Peninsula, where anadromous fish exist above reaches where the stream flows subsurface through peat "pipes". The upstream waters on Stariski Creek were added to the Alaska Anadromous Waters Catalogue after this discovery.</p> <p>Fish swimming through peat "pipes" may also explain the "isolated coho" found in ponds in the Chuitna Coal Project area. These salmon should not be considered to be isolated unless there is evidence other than lack of surface water connection supporting that conclusion.</p>	<p>29a. The assessment of this function ignores the function of headwater streams and wetlands that indirectly support fish habitat. This function should be expanded to include headwater streams or a headwaters function added.</p> <p>29b. Include upstream waters in the above function that may be connected through peat pipes.</p> <p>29c. Coho found in ponds should not be considered isolated without more evidence.</p>	<p>29a. At the agency meetings in January and February 2012, it was decided that a fish habitat function would be added to the FA and that it would be defined as identifying the physical habitat that fish occupy, not the supporting functions. Several other functions assessed in this FA characterize other fish habitat support functions; these include floodflow moderation, surface and subsurface water storage, shoreline stabilization, groundwater discharge, groundwater recharge, carbon export, sediment and toxicant retention, and nutrient retention.</p> <p>29b. There is insufficient information to support extending the anadromous salmonid habitat function through peat pipes at this site.</p> <p>29c. Isolated salmon habitat has been addressed by new mapping. Waterbodies known to support salmon are ascribed the anadromous salmonid habitat function.</p>	No change needed.
30 NVT/ North Ecology	3.5.4 Resident Fish Habitat; Comments on the Anadromous Fish Habitat Function apply here.	30. Same comments as for anadromous fish.	30. Comments addressed above.	No change needed.

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31 NVT/ North Ecology	<p>3.5.6 Floodflow Moderation; The 2008 draft of the Assessment contained a floodflow moderation function that was too restrictive. It did not include all wetlands that performed this function.</p> <p>However, with the addition of a Surface and Subsurface Water Storage function to the 2013 draft, the combined functions are acceptable for addressing the flood moderation function of wetlands.</p> <p>The rationale for this function does not explain the use of a 2.5 foot horizontal buffer to define the floodprone area of steep streams and streams less than 1.5 feet wide. "E" streams in the Rosgen classification system may be narrow and typically traverse very gently sloping ground. These streams may flood well beyond 2.5 feet from the channel. The use of twice the thalweg depth is appropriate for defining floodprone area on these streams</p>	31. Rationale for applying a 2.5-foot horizontal buffer for steep streams, streams less than 1.5 ft. wide, and "E" channels needs to be presented. The use of twice the thalweg depth is appropriate for defining floodprone area on these streams.	<p>31. The ability to simply and accurately estimate the floodprone area in GIS depends on the resolution of the digital elevation data relative to the scale of the features being analyzed. For streams large enough to have an assumed 5-foot-deep thalweg, the project's digital elevation data are sufficient. For smaller streams, they are not.</p> <p>No thalweg depth measurements exist for the smallest of the study-area streams. The selection of a 2.5-foot horizontal buffer was based on an estimate of the typical bottom width of a steep valley incised in a hillslope in the proposed mine site. That width also seemed reasonable for the width that would receive overflow from a channel less than 1.5 feet wide and only inches deep on any gradient. A relatively very small percentage of the small streams on flat slopes are expected to be E channels that might be deeper than a few inches and carry enough water to inundate an area wider than the 2.5-foot buffer at flood stage.</p>	Fully addressed.
32 NVT/ North Ecology	<p>3.5.9 Ground Water Discharge and Recharge; The third paragraph of the rationale states that upland sites are expected to recharge ground water at a much higher rate than wetlands. This is not always true as shown by recent research in Southwestern Alaska. In a glacially developed landscape such as at the Chuitna Coal Project area wetlands were shown to have up to 300% the groundwater recharge rates as uplands (see Rains 2011). Wetlands throughout the watershed may play a significant role in groundwater recharge. This should be clarified.</p> <p>The Assessment should ensure that the groundwater model was properly verified in addition to calibrated to ensure that the model used to determine the extent of groundwater discharge and recharge is fully vetted.</p> <p>We recommend that the authors of the Assessment evaluate the use of the flow-weighted-slope (FWS) method used recently on Kenai Peninsula wetlands studies (see Walker et al., 2012; King et al., 2012; Callahan et al., In review, contact Walker at Kachemak Bay Research Reserve for possible access to manuscript or expected date of publication). FWS accounts for the catchment wetness, topography, and the slope of the flow path, particularly as flow paths approach valley bottoms and streams. It proved useful in describing the hydrologic relationship between wetlands and streams on the Kenai Peninsula. It may better predict which wetlands are likely to act as groundwater discharge sites.</p>	<p>32a. Upland sites do not always recharge groundwater at a higher rate than wetlands; a study in uplands in the Iliamna area showed a higher groundwater recharge rate in wetlands than in uplands.</p> <p>32b. Ensure that the groundwater model was properly verified and calibrated.</p> <p>32c. Consider use of flow-weighted slope method to describe hydrologic relationship between wetlands and streams, particularly groundwater discharge sites.</p>	<p>32a. The statement has been removed from the report.</p> <p>32b. The 2013 groundwater report and the model it documents are subject to review by knowledgeable agency staff.</p> <p>32c. The FA authors reviewed the referenced paper before conducting this assessment, and agree it describes interesting and useful work. But the modeling it describes is beyond the scope of an FA that is prepared to inform the Section 404 review process.</p>	Fully addressed.
33 NVT/ North Ecology	3.5.10 Carbon Export; The rationale for this function is reasonable, except that it should clarify that while a surface connection to a stream is necessary for carbon export, the flow need not be continuous. Flow to the stream may be intermittent and provide a means for a wetland to perform this function.	33. Clarify the necessary type of connection to a stream.	33. Added the word 'geographically' before 'continuous' in two locations. (Clarified that continuity is geographic, not temporal.)	Fully addressed.

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34 NVT/ North Ecology	3.5.11 Sediment and Toxicant Retention; The Opportunity Indicators are limited to wetlands in the floodprone area and wetlands within 30 feet of existing exposed fill or clearings. These criteria are too restrictive to reflect the performance of this function by wetlands at the Chuitna Coal Project. As a mine progressively clears land nearby wetlands will be in a position to accept contaminated water or dust and retain sediment and toxicants. The mine plan can be used to determine the wetlands to which this function should be attributed over time. As mining progresses this function will be important and should be fully assessed spatially and temporally.	34. The indicators for opportunity to perform this function are too restrictive.	34. We agree that the indicators of opportunity may be too limited to fully describe the potential for sediment and toxicant retention during and after mining. At this time, the FA is being used to describe the baseline condition. The indicators are likely to require adjustment to describe future conditions.	Fully addressed.
35 NVT/ North Ecology	3.3.12 Nutrient Retention; Nitrogen compounds that are residue from blasting may contaminate downstream waters through runoff and wind blown dust and should be accounted for in this function. In the same manner as the Sediment and Toxicant Retention function, this function should include wetlands that have the opportunity to retain runoff or dust over the course of mining.	35. The nutrient retention-opportunity function should include wetlands that have the opportunity to retain nitrogen-rich runoff or dust over the course of mining.	35. At this time, the FA is being used to describe the baseline condition. The indicators are likely to require adjustment to describe conditions during and after mining.	No change needed.
36 NVT/ North Ecology	Table 14, footnote b.; There is no superscript "b" in this table so this footnote should be removed. However, all affected wetlands should be included in this analysis, including those within the groundwater drawdown area and those that are isolated by mining.	36a. Apparent typographical error. 36b. The FA should evaluate all wetlands affected by the project, including those affected by groundwater drawdown and isolation.	36a. Footnote b applies to the fish function. 36b. The FA area contains the modeled groundwater drawdown area. It does not include all areas presently being proposed as stream mitigation sites. Wetlands that would be surrounded by infrastructure are within the FA area.	No change needed.

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37 NVT/ North Ecology	<p>Additional Scientific Literature to Consider</p> <p>All but one of the publications listed below contain results of research on nearby wetlands. We recommend that they be reviewed and the results be considered for incorporated into this assessment.</p> <p>Callahan, M.K., M.C. Rains, J.C. Bellino, C.M. Walker, and S.J. Baird. In Review. Trends and controls in surface-water temperatures in headwater streams, Kenai Peninsula, Alaska. Journal of the American Water Resources Association.</p> <p>King, R.S., C.M. Walker, D.F. Whigham, S.J. Baird, and J.A. Back, 2012. Catchment Topography and Wetland Geomorphology Drive Macroinvertebrate Community Structure and Juvenile Salmonid Distributions in South-Central Alaska Headwater Streams. Freshwater Science. 31:341-364.</p> <p>Nadeau, T.L. and M. C. Rains. 2007. Hydrologic connectivity between headwater streams and downstream waters: how science can inform policy. Journal of the American Water Resources Association. Vol 43, No 1:118-132.</p> <p>Rains, M.C. 2011. Water sources and hydrodynamics of closed-basin depressions, Cook Inlet Region, Alaska. Wetlands 31:377-387.</p> <p>Walker, C., R.S. King, D.F. Whigham, and S.J. Baird, 2012. Landscape and Wetland Influences on Headwater Stream Chemistry in the Kenai Lowlands, Alaska. Wetlands. 32:301-310.</p>	37. Please review and consider incorporating the results of several publications.	37. Thank you for passing on relevant research findings. Most of these papers were reviewed for useful concepts during development of the functional assessment methods.	No change needed.
38 USACE	AK NHP data should be used as baseline information for functions related to animals/plants/rare communities.	38. PacRim needs to incorporate existing AKNHP animal, plant, and rare community datasets into the FA	38. AKNHP data were consulted prior to beginning field work in 2006. The AKNHP included no records of tracked plants in the study area at that time. The incidental observations of rare plants made during the Chuitna Coal Project baseline vegetation and wetland studies comprise a much more comprehensive dataset than is available from AKNHP. Another review of the AKNHP online mapping interface (http://aknhp.uaa.alaska.edu/) was conducted on December 2, 2014; no documented occurrences of rare plants or rare community types tracked by AKNHP are mapped in or near the Chuitna project area. Rare community types have been tracked only since approximately 2012.	No change needed.
39 USACE	Assessment area should include anticipated indirect effects areas as well.	39. Areas of indirect effect should be evaluated in the FA	39. The FA study area encompasses the anticipated indirect effects area. It includes the footprints of all project features, plus the modelled groundwater drawdown area, plus an additional buffer area. Please specify the areas expected to be affected that are not included in the FA area.	Fully addressed.

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40 USACE	There is a complete lack of information on functions of peat dominated wetlands vs. non-peat wetlands. Peat wetlands are recognized as performing important functions of carbon sinks, and buffering drying impacts. This is important in Alaska and related to sustainability of salmon.	40. PacRim should expand the FA to evaluate the anticipated functions of peat dominated and non-peat wetlands	40. The FA already evaluates an array of functions that are performed by both peat-dominated and non-peat wetlands. The 12 functions evaluated in this FA, regardless of wetland type, were agreed upon and reviewed by an interagency team led by the Corps in 2012. The Floodflow Moderation function is intended to capture areas that support hydrologic buffers and prevent drying of stream corridors. Other than the carbon sink function, please identify specific functions of peat that are not evaluated in this FA.	Need further guidance from USACE to proceed.
41 USACE	Section 1.0: Suite of ecological functions intended to be used for both streams and wetlands not appropriate. Streams should have different functions than wetlands.	41. The functions evaluated in the FA are insufficient to assess wetlands and streams	41. The ecological functions to be evaluated for this project were agreed upon in agency meetings led by the Corps in 2012. For the purposes of other projects, the Corps has not otherwise identified the ecological functions of streams that it wishes to see evaluated.	Need further guidance from USACE to proceed.
42 USACE	Section 1.0: The word 'essential' is used as a clarifier for certain functions (i.e. habitat). How is this word defined? What is the rationale in using it?	42. Clarify the use and rationale of the term 'essential'	42. The word 'essential' came from Wildlife Protection Plans prepared by ABR. Footnote from p. 6: "ABR assessed habitat importance differently for the various species groups, and defined 'essential', 'negligible', and other such terms slightly differently among species groups. Approximate definitions, summarized or excerpted by HDR from the <i>Wildlife Protection Plans</i> (ABR 2008a, b, c), are as follows: "essential" = critical to survival or completion of the life cycle or successful reproduction; 'high' and 'moderate' = used regularly, with 'high' being used more often; 'low' = used little or infrequently; and 'negligible' = no use or very rare occasional use."	Fully addressed.
43 USACE	Section 3.1: Assessment approach will identify where function is expected to occur at "a relatively high level". I am not sure this method should be acceptable – Corps needs to determine goals of FA use first in order to assess. The aquatic resources that would not meet this presense/absense test would then potentially not require mitigation. This is a serious flaw. I believe FA should assess 'where it is expected to occur and at what level'/ Suitability over a range, rather than an apparent yes or no on 'relatively high level' or not.	43. The ranking system used for this FA is unacceptable and will prevent the Corps from determining appropriate mitigation	43. This 'yes/no' approach was approved in one of the 2012 agency meetings led and attended by the Corps. The Corps has not disclosed how it will use the FA to determine appropriate mitigation.	Fully addressed.
44 USACE	Section 3.1: The cited references/baseline data reports should be quality control checked by our 3 rd Party Contractor.	44. References used in the FA should be checked by the 3 rd Party Contractor	45. Noted. This document will be provided to the 3 rd Party Contractor in support of the EIS process.	Fully addressed.

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45 USACE	Section 3.2: There is inadequate information on justification/development/rational for how/why the listed functions were selected.	45. Additional justification, development, and rationale for how and why the listed functions were selected is needed	<p>45. Before updating the FA, PacRim solicited USACE feedback on the methods. The USACE suggested that FA methods have evolved since the 2008 assessment and convened an interagency meeting with PacRim to discuss alternative approaches. The USACE hosted meetings on January 26, February 16, October 5 and 16, and November 21, 2012. At these meetings, agency staff requested that additional ecological functions be assessed, asked for clarification of the rationale behind some of the original methods, and suggested alternative ways to analyze some functions. PacRim presented draft methods in writing in August 2012, three agencies provided written comments, and the late 2012 meetings entailed discussion and resolution of those comments. The methods PacRim and the agencies agreed upon were at a conceptual level of development.</p> <p>HDR could provide responses to agency comments that were discussed in these meetings and could provide the presentation materials as well if that would be helpful.</p>	Fully addressed.
46 USACE	Section 3.2: 'Nutrient Retention' – why is removal & transformation not included as well?	46. Why is nutrient removal and transformation not included in the Nutrient Retention function	46. The function's definition is as follows: "Wetlands that remove nutrients (nitrogen and phosphorus) from downgradient flow on a net annual basis through transformation of nutrients from inorganic to organic forms, retention within vegetation or dead organic matter, storage when adsorbed to deposited sediments, or removal of nitrogen by release to the atmosphere as nitrogen gas."	Fully addressed.
47 USACE	Section 3.3: "Lack of attribution of a function... does not imply that the function does not occur there- just that the magnitude or likelihood is less than at other wetlands." This then would be a misleading conclusion and assessment should not reach these conclusions.	47. Further clarification is needed when 'lack of attribution of a function' may be erroneously inferred	47. The conclusion would be that, if a wetland or waterbody is not ascribed the function, the function either is unlikely to occur at that site or it may occur there at a relatively low magnitude.	Fully addressed.
48 USACE	Section 3.5.1: 'Habitat for Bird Species of Conservation Concern' should not be a function. There is not a clear definition of what this list is, the rationale behind it, whether it was approved by FWS, etc. Function should be related to our EO on migratory birds in general.	48. Further clarification is needed to support why and how the 'Habitat for Bird Species of Conservation Concern' function is being evaluated in this FA	48. The list for BSCC is clearly described in Appendix B. This function was agreed upon in the 2012 interagency meetings attended and led by the Corps and through other communications. Please specify how to define and assess a migratory bird function.	Need further guidance from USACE to proceed.

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49 USACE	Section 3.5.1: Provide rationale/justification for the use of ≥ 25 %	49. Provide the rationale behind the threshold used to ascribe the BSCC function	49. The 25% threshold is based solely on best professional judgment. Scientists considered it sufficiently conservative; habitats that provide only low-value habitat (1, on a scale of 0 to 4) for only 25% of the BSCC that occur in that project component are ascribed this function. This was a function newly added based on agency comment in 2012. The method that was used was presented in the August 2012 draft methods report. Agencies were offered the opportunity to comment on these methods. USFWS commented on the cutoffs and suggested that perhaps any habitat use by a BSCC should be considered important and asked how that would change the outcome of the assessment. Agencies and PacRim discussed this comment on October 16, 2012. HDR reported that ascribing this function to habitat types considered of low value for any BSCC would mean every habitat type except sweetgale fen would be considered to perform the function (which is not helpful for distinguishing among wetland types). Meeting notes state: "At the end of this discussion, EPA and USFWS agreed that they approve of the FA methods for diversity and no changes are needed..." (not for BSCC). Action items did not include changing the BSCC function. However, as a result of this meeting, PacRim added a function: Essential Habitat for One or More Wildlife Species.	Fully addressed.
50 USACE	Section 3.5.2: Provide rationale/justification for the use of ≥ 25 %	50. Provide the rationale behind the threshold used to ascribe the Wildlife Species Richness function	50. The 25% threshold is based solely on best professional judgment. This function was described in the August 2012 draft FA Methods for agency review. Meeting notes state: "At the end of this discussion, EPA and USFWS agreed that they approve of the FA methods for diversity [richness] and no changes are needed..."	Fully addressed.
51 USACE	Section 3.5.2: Use NHP data for wildlife. There is no rationale/justification of why list does not include other animals (e.g., lynx, wolves, bats, martens, etc.)	51a. PacRim needs to incorporate existing AKNHP animal datasets into the FA 51b. Provide rationale and justification as to why certain mammals are excluded from the list	51a. AKNHP wildlife data were not originally examined and considered for use in this FA. Site-specific wildlife surveys conducted for Chuitna Coal Project baseline studies were judged to comprise a much more comprehensive dataset than is available from AKNHP. Another review of the AKNHP online mapping interface (http://aknhp.uaa.alaska.edu/) was conducted on December 2, 2014; AKNHP datasets only address rare species; no documented occurrences of rare species tracked by AKNHP are mapped in or near the Chuitna project area. 51b. This FA is not intended to evaluate all mammals occupying the study area. Rather, select species that are fully or partially dependent on wetlands are waterbodies for various life stages were considered for this FA. The list of mammals used was presented to, discussed with, and agreed upon by the interagency team that reviewed the FA methodology in 2012.	Fully addressed.

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52 USACE	Section 3.5.3: Difficult to concur with statement that “for most species, no habitat types in the study area were rated as essential”. Provide additional supporting information to explain why this was the case.	52. Provide justification for the conclusion statement that “for most species, no habitat types in the study area were rated as essential”	52. This is a conclusion drawn directly from wildlife baseline studies; specifically from the June 2008 Chuitna Project Infrastructure: Wildlife Protection Plan Part D7-2 prepared by ABR, Inc. Supporting information is presented in those studies.	Fully addressed.
53 USACE	Section 3.5.4: Provide a map showing the ‘Waterbodies and wetlands that directly provide physical habitat for anadromous fish’, and how this was determined (i.e., what data/sources were used). This map should be a layer on the PJD map.	53. Provide a map of ‘Waterbodies and wetlands that directly provide physical habitat for anadromous fish’ and describe the information sources used to identify these areas	53. As requested, the revised FA will describe the information sources used and will present a map of this function.	Fully addressed.
54 USACE	Section 3.5.4: Adjacent supportive habitat should be assessed relative to this function. Wetlands not ‘directly providing physical habitat’ for anadromous fish also critical in maintaining physical, ecological integrity of direct habitat.	54. Additional indirect habitat and functions should be considered for the anadromous fish function	54. The agencies and PacRim agreed in meetings in 2012 that the fish functions would be defined as the in-water areas directly used by fish. The following functions which are assessed in the FA indirectly support in-water fish habitat: Groundwater Recharge, Groundwater Discharge, Floodflow Moderation, Shoreline Stabilization, Carbon Export, Surface and Subsurface Water Storage, Sediment and Toxicant Retention, and Nutrient Retention. The fish function names have been clarified to distinguish between anadromous salmonid species and all others.	Fully addressed.
55 USACE	Section 3.5.5: Provide a map showing the ‘Waterbodies and wetlands that directly provide physical habitat for resident fish’, and how this was determined (i.e., what data/sources were used). This map should be a layer on the PJD map.	55. Provide a map of ‘Waterbodies and wetlands that directly provide physical habitat for resident fish’ and describe the information sources used to identify these areas	55. As requested, the revised FA will describe the information sources used and will present a map of this function.	Fully addressed.

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56 USACE	Section 3.5.5: Adjacent supportive habitat should be assessed relative to this function. Wetlands not 'directly providing physical habitat' for resident fish also critical in maintaining physical, ecological integrity of direct habitat.	56. Additional indirect habitat and functions should be considered for the resident fish function	56. The agencies and PacRim agreed in meetings in 2012 that the fish functions would be defined as the in-water areas directly used by fish. The following functions which are assessed in the FA indirectly support in-water fish habitat: Groundwater Recharge, Groundwater Discharge, Floodflow Moderation, Shoreline Stabilization, Carbon Export, Surface and Subsurface Water Storage, Sediment and Toxicant Retention, and Nutrient Retention. The fish function names have been clarified to distinguish between anadromous salmonid species and all others.	Fully addressed.
57 USACE	Section 3.5.6: Inferences based heavily on previous documented 'observations' only. The data from these observations should be quality controlled. Can NHP or other data contribute to ascribing the function?	57a. Rare plant observations should be quality controlled 57b. Consider using AKNHP datasets for the Rare Plant Habitat function	57a. Incidental field observations of rare plants made by the wetland and vegetation teams comprise the best available data for the Chuitna project area. A number of observations of each of the rare species found in the project area were made by Mike Duffy who is widely considered one of the top botanists that regularly conducts plant surveys in Alaska. Voucher specimens exist for each of the tracked species. More guidance is needed for the Corps of Engineers to determine how the observations should be quality controlled. 57b. AKNHP data has been reviewed for this function. Incidental observations of rare plants made during project comprise a much more comprehensive dataset than is available from AKNHP. No documented occurrences of rare plants or rare community types tracked by AKNHP are mapped in or near the Chuitna project area.	Fully addressed.
58 USACE	Section 3.5.11: Should include Carbon sequestration; and differentiation between peat vs non peat wetlands would seem imperative.	58a. Carbon Sequestration should be added as a function 58b. The FA should differentiate between peat and non-peat wetlands	58a. Carbon sequestration was not requested as a function to be assessed during the series of meetings, comments and responses, and Methods document of 2012. 58b. To be able to address the USACE request to differentiate between peat and non-peat wetlands, further guidance is requested. Specific questions include: <ul style="list-style-type: none"> • What other specific functions of peat wetlands have not been addressed by the functions already addressed? • How have functions of peat not been addressed within those functions? 	Need further guidance from USACE to proceed.